

achieving a requested drive power singly by an engine output with the gear speed selected; otherwise

achieving the requested drive power by the engine output and a motor output when the requested drive power is not achievable singly by the engine output; otherwise changing the gear speed by increasing a gear ratio when the requested drive power is not achievable by the engine output and the motor output.

REMARKS

Claims 1-6, 20 and 21 are pending. By this Amendment, claims 1, 2, 20 and 21 are amended. No new matter has been added. The attached Appendix includes a marked-up copy of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

Reconsideration in view of the above amendments and following remarks is respectfully requested. In addition, the courtesies extended by Examiner Waks during the July 30, 2002 telephone interview are appreciated. The substance of the interview is reflected in the following remarks.

I. THE CLAIMS SATISFY FORMAL REQUIREMENTS

The Office Action rejects claims 1-6 and 20 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Although the Office Action fails to specify how claims 1-6 and 20 are indefinite, claims 1, 2, 20 and 21 are amended to correct a typographical error noted by Applicants and to improve the English syntax. It is respectfully submitted that claims 1-6 and 20 now fully comply with 35 U.S.C. §112, second paragraph. Accordingly, withdrawal of the rejection is respectfully requested.

II. THE CLAIMS DEFINE PATENTABLE SUBJECT MATTER

The Office Action rejects claims 1-6, 20 and 22 under 35 U.S.C. §102(e) over Ibaraki (U.S. Patent No. 5,942,879). Applicants note that claim 22 is withdrawn from consideration.

Thus, it is assumed that the rejection of claim 22 was intended to be a rejection of claim 21. This rejection is respectfully traversed.

Claim 1 recites a control apparatus for a hybrid vehicle comprising a controller that detects a drive power requested for the vehicle drive wheel and adjusts drive power by setting an engine output increase, a motor output increase and a gear speed change by increasing a gear ratio, in an order of descending priorities of (1) the engine output, (2) the motor output and (3) the gear speed change by increasing a gear ratio, so as to achieve the drive power requested. It is respectfully submitted that none of the references of record teach, disclose or suggest the control apparatus as recited in claim 1.

Ibaraki does not teach or suggest the control apparatus that detects a drive power request and adjusts the drive power by setting an engine output increase, a motor output increase and a gear speed change in an order of descending priorities as claimed. On the contrary, Ibaraki is directed to regeneration control so that an optimal rotational speed of the motor is calculated in accordance with an extra output "EXPOWER" of the engine, an engine speed "NE" and a regeneration output limit "REGLMT" of the motor, and a gear ratio to the transmission is controlled such that the rotational speed of the motor is equal to the optimal rotational speed (col. 12, lines 49-62). Ibaraki computes a desired output from the traction motor according to deceleration conditions of the vehicle, computes an optimal rotational speed of the traction motor at which the traction motor provides maximum regeneration output and controls the gear ratio of the transmission such that the rotation speed of the traction motor is equal to the optimal rotational speed for regeneration (Abstract).

In other words, Ibaraki controls the gear ratio to establish that the rotational speed of the engine is the rotational speed of the motor. Ibaraki does not teach or suggest adjusting drive power by setting (1) an engine output increase, (2) a motor output increase and (3) a gear speed change by increasing a gear ratio in sequence.

Therefore, it is respectfully submitted that claim 1 is patentable over all of the references of record. Further, it is respectfully submitted claims 2-6 are each patentable at least in view of the patentability of claim 1 from which they respectively depend, as well as for the additional features they recite. Withdrawal of the rejection is respectfully requested.

Claim 20 similarly recites a control method for a hybrid vehicle. As recited in claim 20, the control method comprises: detecting a drive power requested for the drive wheel; and adjusting the drive power by setting an engine output increase, a motor output increase, and a gear speed change by increasing a gear ratio, in an order of descending priorities of: (1) the engine output increase, (2) the motor output increase, and (3) the gear speed change by increasing the gear ratio, so as to achieve the drive power requested. It is respectfully submitted that none of the references of record teach, disclose or suggest these claimed features.

For at least the reasons set forth above with respect to claim 1, it is respectfully submitted that claim 20 is patentable over all of the references of record. Further, it is respectfully submitted claim 21 is patentable at least in view of the patentability of claim 20 from which it depends, as well as for the additional features it recites. Withdrawal of the rejection is respectfully requested.

III. CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-6, 20 and 21 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,



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Attachment:
Appendix

Date: July 30, 2002

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<p>DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>

APPENDIX

Changes to Claims:

The following is a marked-up version of the amended claims:

1. (Amended) A control apparatus for a hybrid vehicle having an engine and a motor as drive power sources, and having a transmission that is disposed between the engine and a vehicle drive wheel and that changes drive power transmission by selection from a plurality of gear speeds, the control apparatus comprising:

a controller that detects a drive power requested for the vehicle drive wheel and that adjusts the drive power by setting an engine output increase, a motor output increase, and a gear speed change ~~in~~ by increasing a gear ratio ~~increasing direction~~, in an order of descending priorities of: (1) the ~~motor~~ engine output increase, (2) the motor output increase, and (3) the gear speed change ~~in~~ by increasing the gear ratio ~~increasing direction~~, so as to achieve the drive power requested.

2. (Amended) A control apparatus according to claim 1, wherein the controller:

(a) initially selects a gear speed of a ~~least~~ low gear ratio within a range such that an engine revolution speed higher than or equal to a predetermined lower limit revolution speed is attainable;

(b) achieves the requested drive power singly by the engine output with the gear speed selected; otherwise

(c) achieves the requested drive power by the engine output and motor output when the requested drive power is not achievable singly by the engine output; otherwise

(d) changes the gear speed ~~in~~ by increasing a gear ratio ~~increasing direction~~ when the requested drive power is not achievable by the engine output and the motor output.

20. (Amended) A control method for a hybrid vehicle having an engine and a motor as drive power sources, and having a transmission that is disposed between the engine and a vehicle drive wheel and that changes drive power transmission by selection from a plurality of gear speeds, the control method comprising:

detecting a drive power requested for the drive wheel; and

adjusting the drive power by setting an engine output increase, a motor output increase, and a gear speed change ~~in by increasing a gear ratio-increasing direction~~, in an order of descending priorities of: (1) the ~~motor~~ engine output increase, (2) the motor output increase, and (3) the gear speed change ~~in by increasing the gear ratio-increasing direction~~, so as to achieve the drive power requested.

21. (Amended) A method according to claim 20, wherein the drive power adjusting step includes the steps of:

initially selecting a gear speed of a ~~least~~ low gear ratio within a range such that an engine revolution speed higher than or equal to a predetermined lower limit revolution speed is attainable;

achieving a requested drive power singly by an engine output with the gear speed selected; otherwise

achieving the requested drive power by the engine output and a motor output when the requested drive power is not achievable singly by the engine output; otherwise

changing the gear speed ~~in by increasing a gear ratio-increasing direction~~ when the requested drive power is not achievable by the engine output and the motor output.